September 30, 2009

2009 Fall Edition

# The Mountain News Journal

## What's New at Jackson???

By: Shawn B. Harley, Meteorologist-in-Charge

Greetings from your friends and neighbors at the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) Forecast Office in Jackson, Kentucky. In the fall 2007 newsletter I wrote about the Kentucky Mesonet, a network of environmental observing stations being installed throughout the Commonwealth. There has been a tremendous amount of work accomplished on the mesonet over the past two years, and I want to bring you up to date on the latest developments.

As you may recall the mesonet is a collaborative effort between the Kentucky Climate Center at Western Kentucky University and NOAA's National Weather Service. The mesonet, which is being developed and maintained by the Kentucky Climate Center, consists of a network of observation stations with high quality instrumentation to measure temperature, precipitation, humidity, wind speed and direction, and solar radiation. Surveying of potential sites and installation of new observing stations has continued to progress at a steady pace over the past 2 years.

This past August, three new stations in the eastern part of the state began transmitting data. These include observation stations near Paintsville, West Liberty and Maysville. As of August 31, 2009, there were 33 operational mesonet stations across the state. Just a year ago, on August 31, 2008 there were only 10 operational sites, and on August 31, 2007, there were just 3 operational sites. More sites will be added soon. At the end of August there were 7 installations under way, and 4 other installations were scheduled to begin soon.

Active site searches continue to be conducted in several counties across eastern Kentucky. Dave Stamper, of the National Weather Service Forecast Office in Jackson, has been very active in working to identify potential sites in the eastern part of the state. A good quality observation site needs to be in a level open area away from buildings, cliffs and trees. The rugged forested terrain of eastern Kentucky makes finding such suitable open areas extra challenging. Despite the challenges steady progress continues to be made in eastern Kentucky. Within the past year, five new sites were installed in the counties served by the Jackson National Weather Service Forecast Office. In addition to the sites already mentioned at West Liberty and Paintsville, stations near Barbourville, McKee and Jackson came on line within the past year. Also, as of the end of August, installation of a site near Booneville had begun.

You can view live data from the mesonet stations by visiting http://www.kymesonet.org/live_data.html. An interesting exercise for those living in eastern Kentucky is to compare the observations at the Breathitt County mesonet site with observations from the National Weather Service Automated Surface Observing System (ASOS) located just a few miles away at the Julian Carroll Airport. Observations from both of these sites can be viewed at http://www.crh.noaa.gov/jkl/observations.php. The Breathitt County mesonet site is in a valley location at the University of Kentucky Robinson Station while the National Weather Service observation is from the ridge top at the airport.

As anyone who lives in eastern Kentucky knows, there can be considerable temperature differences between ridge tops and nearby valleys. This can be especially pronounced in certain weather situations at certain times of the year. For example this past April the average monthly low at the Breathitt County mesonet station was 40.7 degrees, while the average monthly low at the National Weather Service ASOS was 47.5. Differences on individual days can be dramatic, such as on April 25, when the minimum temperature at the Breathitt County mesonet station was 20 degrees cooler than the minimum temperature observed at the Jackson Julian Carroll airport site. With such variation possible, one can see how critical it is to have a good network of both valley and ridge top observing sites in eastern Kentucky. It is important to note the Kentucky mesonet allows for improved monitoring and analysis of meteorological conditions across the state, and is utilized in daily forecast and warning operations by the National Weather Service.

All of us at your National Weather Service Forecast Office in Jackson wish you a safe and happy fall and winter. As always, we would appreciate hearing from you. If you have any comments regarding our webpage or the services we provide please give us a call, send us an email, or drop us a note. We are constantly striving to improve our products and services and your feedback is important to us.

## Climate Summary

By: Jeffrey Carico
Hydrometeorological Technician

**Summer Season 2009**

The summer season of 2009 saw much wetter than normal conditions with some cool temperatures. Thanks to a very wet June and July of 2009 across Eastern Kentucky, Jackson ended up over three and a half inches above normal. In fact, the Jackson Weather Office had the 4th wettest June and 5th wettest July on record. Also, the London Corbin Airport had their 7th wettest June. Overall, it was the 3rd wettest summer at Jackson and the 10th wettest summer at London. On the temperature side of the fence, both locations ended up a cooler than normal for Summer 2009. Jackson ended up a degree and a half below normal, and London was one degree cooler. July was the main culprit behind the cooler than normal conditions. July 2009 was the coolest July ever at Jackson, while London saw July as the 4th coolest ever. Strangely enough, London also saw June 2009 as its 9th warmest June. The rankings from the Summer of 2009 saw Jackson place at the 3rd coolest summer, while London saw this summer rank as only the 18th coolest, thanks in big part to the warm June.

The Jackson Weather Office ended the summer season with a maximum average temperature of 80.3 degrees and a minimum average temperature of 63.5 degrees. The mean temperature for summer 2009 was 71.9 degrees which is 1.5 degrees below the normal temperature of 73.4 degrees. Also of note, Jackson did not record a 90 degree temperature this summer. Jackson averages 13.3 days with a temperature of 90 degrees or above. The Jackson precipitation total for the summer was 16.98 inches. This amount is 3.59 inches above the normal of 13.39 inches.

The London-Corbin Airport finished summer with an average temperature of 73.0 degrees which is 1.0 degree below the normal of 74.0 degrees. London had a maximum average of 82.4 degrees with a minimum average of 63.6 degrees. During the summer of 2009, the London-Corbin Airport tallied 3 days with temperatures of at least 90 degrees. London typically averages 16.4 days with temperatures reaching 90 degrees or higher during summer. London received 15.01 inches of precipitation through June, July and August which is 3.02 inches wetter than the normal of 11.99 inches.

Looking ahead towards fall 2009, the Climate Prediction Center has indicated that near normal temperatures and near normal precipitation can be expected over September, October and November.


## Weather Spotter Training

By: Jim Maczko
Warning Coordination Meteorologist

The National Weather Service (NWS) in Jackson, KY will be providing spotter training to anyone that is interested in becoming a weather spotter. A weather spotter provides a vital service to the NWS and to his/her community by providing actual "Ground Truth" directly to the National Weather Service. Spotters generally report significant events such as damaging winds, heavy rain, tornadic activity, ice and snow, along with other events that have an impact on the forecast or the safety of the community.

The National Weather Service generally conducts these training sessions during the spring and fall. These sessions are scheduled by the NWS in conjunction with local emergency managers. Please contact your County Emergency Management Agency to request a NWS Spotter Training Session for your area.

For a schedule of eastern Kentucky Spotter Training Sessions, visit: http://www.crh.noaa.gov/jkl/?n=spotter.

## Important Web Pages

By: Jim Maczko
Warning Coordination Meteorologist

National Weather Service Jackson, Kentucky Home Page:

**www.weather.gov/jacksonky**

Local Regional and National Radars:

**www.weather.gov/radar**

NOAA All-Hazards Weather Radio Information:

**www.weather.gov/nwr**

Weather Safety Information:

**www.weather.gov/safety.php**

Wind Chill Chart and Information:

**www.weather.gov/os/windchill/index.shtml**

Kentucky Cooperative Observer Precipitation Amounts:

**www.cocorahs.org/state.aspx?state=ky**

# The Ridge and Valley Split — Temperatures

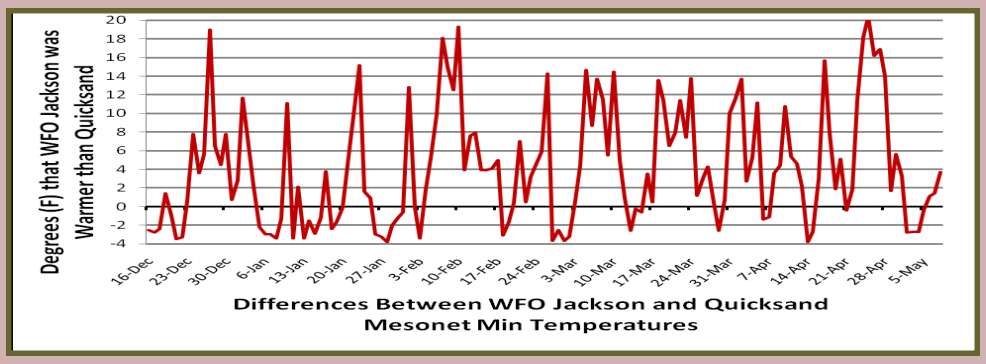
By: Gary Votaw
Science and Operations Officer

After the Weather Forecast Office at Jackson/Julian Carroll Airport was established to begin 1981 the forecast staff began to realize that the difference between temperatures on the ridges and in the valleys of eastern Kentucky became quite intense at times, more so than had been understood until then. As we know from basic chemistry cool air sinks relative to adjacent warmer air. That also applies to air cooling on hillsides which tends to slide to lower elevations though a breeze can sweep it away before doing so. Eastern Kentucky is more complicated than most mountain locations in this regard since the valleys and hollows are narrow enough that mountain ridges efficiently shelter low lying areas so that wind cannot easily mix warmer ridge top air into the valleys. But the slopes are very steep so not much cool air is able to develop on the slopes. The point is that this process requires more study to be able to forecast it better.

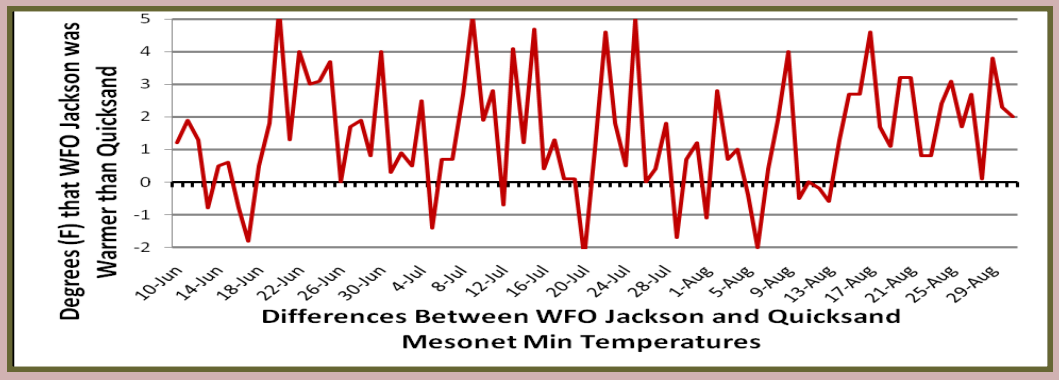
These forecasters came to know that under certain conditions temperatures in the valleys and hollows became 10 to 20 degrees (or more?) cooler than ridges at the same times. These conditions generally included clear skies, light wind and/or warmer air arriving at the ridge top before reaching into the valley, and possibly other factors that had, so far, not been considered. But just how often this occurred and how intense the differences became were not well understood because no thermometers were placed on both a valley and a ridge while close enough in proximity to compare them in a scientific study.

The Kentucky Climate Center at Western Kentucky University (WKU) is developing a network of automated weather stations (http://www.kymesonet.org/index.html) to aid detection, prediction, and research of weather, and to aid decision making regarding how much weather related risk should be acceptable (such as the probability of rain when concrete must be poured, the likelihood of ice melting off of power lines, or ice and snow sticking on highways). As of September 1, 2009, 33 such stations had been established and many more are in the works. One of those was placed near Quicksand (near Quicksand Creek) last December; close enough (3.5 miles) to the Jackson weather office (on a ridge top) and enables study of this phenomenon. A group of meteorologists, climatologists, and students at WKU and the National Weather Service have teamed to study how this might be better forecasted.

The chart below shows how the minimum temperature differed each day between the Jackson airport and Quicksand from the time the Quicksand Mesonet location started transmitting data on December 16th, 2008, until the flood temporarily knocked it out on May 8th of this year. It shows how often and how much the ridge top was warmer (or cooler) than the valley. It was probably not surprising to most forecasters to see how extreme the differences can become between the sites, but it was regarding how often it does so. The difference reached 10°F or more on 30 out of the 144 days (21%) up to May 8th. This ridge/valley "split" apparently occurs to this extreme much more frequently than in other places in the United States with similar elevation changes in mountains.




The second chart below shows the same data as in the first but from the time Quicksand became operational again on June 10th. The difference between the sites did not reach 10°F again through August. While extreme differences are primarily non-summer events a difference of 5°F is significant for a summer occurrence and, again, must be studied to learn how to forecast it. Results of our partnered study with WKU are expected to be included in a later issue of this newsletter.



# Winter Weather Information

By: Jim Maczko
Warning Coordination Meteorologist

**Avoid overexerting yourself** in activities such as shoveling heavy snow, pushing a car or walking in deep snow- as the strain from the cold combined with the hard labor may cause a heart attack.

**Dress for the season** by wearing loose, lightweight warm clothes in layers. Outer garments should be tightly woven, water repellent and hooded. Wear a hat, as half of your body heat loss can be from the head. Cover your mouth to protect your lungs from extreme cold.

**Limit exposure to extreme cold** by staying indoors or covering as much open skin as possible if you have to be outdoors. A wind chill of -20 degrees Fahrenheit takes only 30 minutes to cause frostbite.

## NWS Windchill Chart

| Wind (mph) \ Temperature (°F) | Calm | 40 | 35 | 30 | 25 | 20 | 15 | 10 | 5 | 0 | -5 | -10 | -15 | -20 | -25 | -30 | -35 | -40 | -45 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | | 36 | 31 | 25 | 19 | 13 | 7 | 1 | -5 | -11 | -16 | -22 | -28 | -34 | -40 | -46 | -52 | -57 | -63 |
| 10 | | 34 | 27 | 21 | 15 | 9 | 3 | -4 | -10 | -16 | -22 | -28 | -35 | -41 | -47 | -53 | -59 | -66 | -72 |
| 15 | | 32 | 25 | 19 | 13 | 6 | 0 | -7 | -13 | -19 | -26 | -32 | -39 | -45 | -51 | -58 | -64 | -71 | -77 |
| 20 | | 30 | 24 | 17 | 11 | 4 | -2 | -9 | -15 | -22 | -29 | -35 | -42 | -48 | -55 | -61 | -68 | -74 | -81 |
| 25 | | 29 | 23 | 16 | 9 | 3 | -4 | -11 | -17 | -24 | -31 | -37 | -44 | -51 | -58 | -64 | -71 | -78 | -84 |
| 30 | | 28 | 22 | 15 | 8 | 1 | -5 | -12 | -19 | -26 | -33 | -39 | -46 | -53 | -60 | -67 | -73 | -80 | -87 |
| 35 | | 28 | 21 | 14 | 7 | 0 | -7 | -14 | -21 | -27 | -34 | -41 | -48 | -55 | -62 | -69 | -76 | -82 | -89 |
| 40 | | 27 | 20 | 13 | 6 | -1 | -8 | -15 | -22 | -29 | -36 | -43 | -50 | -57 | -64 | -71 | -78 | -84 | -91 |
| 45 | | 26 | 19 | 12 | 5 | -2 | -9 | -16 | -23 | -30 | -37 | -44 | -51 | -58 | -65 | -72 | -79 | -86 | -93 |
| 50 | | 26 | 19 | 12 | 4 | -3 | -10 | -17 | -24 | -31 | -38 | -45 | -52 | -60 | -67 | -74 | -81 | -88 | -95 |
| 55 | | 25 | 18 | 11 | 4 | -3 | -11 | -18 | -25 | -32 | -39 | -46 | -54 | -61 | -68 | -75 | -82 | -89 | -97 |
| 60 | | 25 | 17 | 10 | 3 | -4 | -11 | -19 | -26 | -33 | -40 | -48 | -55 | -62 | -69 | -76 | -84 | -91 | -98 |

Frostbite Times: 30 minutes | 10 minutes | 5 minutes

Wind Chill (°F) = $35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$

Where, T= Air Temperature (°F) V= Wind Speed (mph)

Effective 11/01/01

**Winter Weather - Did You Know?**

- About 70% of all injuries due to snow and ice result from vehicle accidents?

- 50% of injuries related to cold happen to people over 60 years old

**Winter Weather Family Disaster Kit**

You and your family should prepare for the winter weather hazards of eastern Kentucky by developing a family disaster plan and putting together a Family Disaster Supply Kit.

**A Disaster Supply Kit Should Include:**

- A 3-day supply of water (1 gallon per day per person)
- Food that will not spoil
- One change of clothing and shoes per person
- One blanket or sleeping bag per person
- A First-Aid Kit
- A 7-day supply of prescription medicines
- Emergency Tools
- Battery Powered NOAA Weather Radio and AM/FM Radio
- Flashlight with extra batteries
- Special items for infant, elderly or disabled family members

For more information on Family Disaster Kits and Family Disaster Plans, visit www.ready.gov

Visit us on the web at: http://www.weather.gov/jacksonky

# Why Leaves Change Colors in the Fall

By: Tabitha Brewer
Administrative Support Assistant

Each Fall, eastern Kentucky looks as if an artist has taken his paintbrush and created a mosaic of beautiful, vibrant colors as the leaves change from green to various shades of red, orange and yellow. Have you ever wondered what makes this change occur?

Leaves changing colors in the Fall is the process that trees undertake to get ready for the winter. The change in the color of the leaves has to do with the pigmentation within the leaves. All during the spring and summer months, the leaves serve as factories where most of the foods necessary for the tree's growth are created. The process of making this food actually takes place inside each leaf in the cells that contain chlorophyll. Chlorophyll actually masks the true color of the leaves by absorbing all other light colors and reflecting only the green light spectrum, thus making the leaves appear to be green.

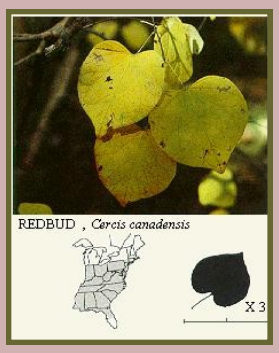
When the days become shorter and the temperatures become cooler at night, several changes start to take place inside the trees. One major change is the development of a corky membrane between the branch and the leaf stem. This membrane interrupts the flow of nutrients into the leaf, thus slowing down the development of chlorophyll in the leaf. As the chlorophyll decreases inside the leaf, the green coloration of the leaf begins to fade.

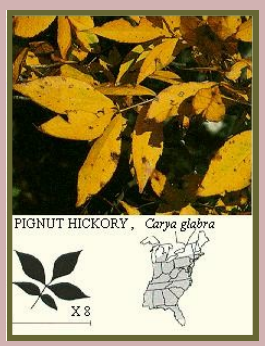
The different chemical components that are present inside each leaf determines whether it will be red, orange or yellow. Weather also plays a factor in determining the color of the leaf. Leaves exposed to the sun may turn red, while those that are shaded may be yellow or orange. The intensity of colors on the same tree may vary from year to year, depending upon the combination of weather conditions. According to tree experts at several universities, the most vivid colors appear after a warm, dry summer combined with early autumn rains. Long periods of wet weather in late fall will produce a rather drab display of colors. The bright reds and purples are made mostly in the fall. In some trees, such as maples, glucose is trapped in the leaves after photosynthesis stops. Sunlight and the cool nights cause the leaves to turn this glucose into a red color. The brown color of trees like oaks is made from wastes left in the leaves.

Temperatures also play an important role in the coloration of leaves. The best colors seem to be visible when warm and sunny days are followed by cold nights through early October. Light frost will enhance the colors, but a hard, killing frost will cause the leaves to drop off the trees at a quicker pace.

Below are some examples of trees that are native to Kentucky and how they appear in the fall:





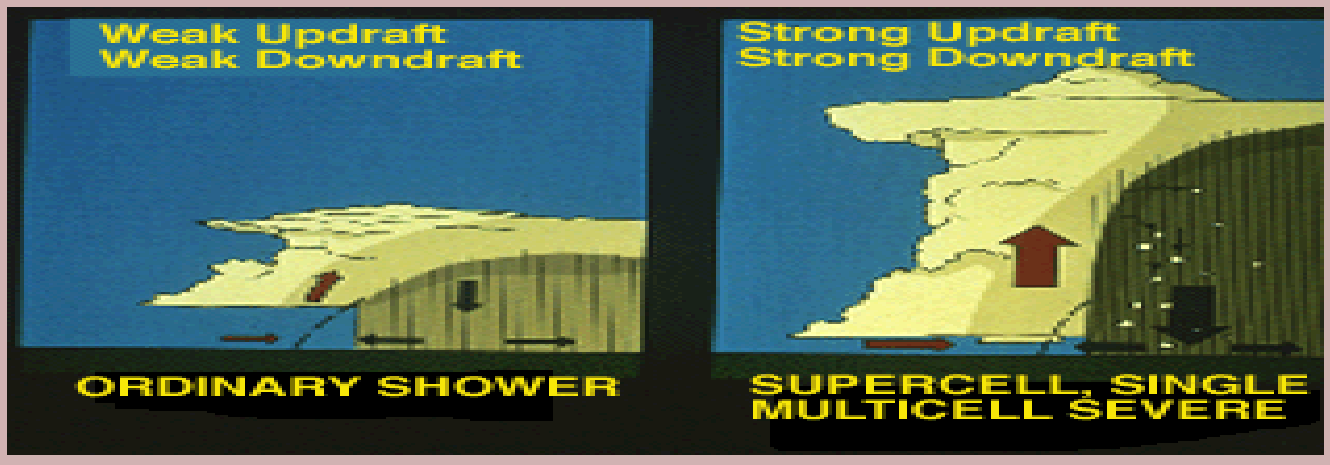
# Low Level Wind Shear: Invisible Enemy to Pilots

By: Brian Schoettmer
General Forecaster

On the afternoon of August 2, 1985 a landmark aircraft accident occurred at the Dallas/Fort Worth airport. The tragic accident, which killed 137 of the 163 passengers on board Delta Airlines Flight 191, was responsible for making "windshear" a more commonly known weather phenomenon and implementing many new changes with regard to wind shear detection. **(Ref. 1)** That afternoon, thunderstorms were in the area of approach to runway 17L at the DFW International Airport, with a thunderstorm rain shaft right in the path of final approach. The crew decided to proceed through the thunderstorm, which turned out to be a critical error. Shortly after entering the thunderstorm, turbulence increased and the L1011 aircraft encountered a 26 knot headwind. Just as suddenly, the wind switched to a 46 knot tailwind, resulting in a loss of 72 knots of airspeed. This much of an airspeed loss on final approach, when the jet was only 800 feet above the surface, was unrecoverable and the aircraft eventually crashed short of the runway. **(Ref. 1)** The sudden change in wind speed and direction that the aircraft encountered is called wind shear.

Wind shear can occur at many different levels of the atmosphere, however it is most dangerous to pilots at the low levels as a sudden loss of airspeed and altitude can occur. Plenty of altitude is normally needed to recover from the potential stall produced by the abrupt change in wind speed and direction; which is why pilots need to be aware of the hazards and mitigation of low level wind shear. So how does the phenomenon occur? There are a couple of ways this occurs, with the most dangerous coming from thunderstorm updrafts and downdrafts. The lifecycle of a thunderstorm starts with just an updraft as warm moist air at the surface rises in an unstable atmosphere to heights as high as 50 to 60 thousand feet in the air. As the updraft matures, precipitation begins to form and fall out as rain. This is when the downdraft portion of the thunderstorm occurs. Rain-cooled air sinks along with the downward drag from falling precipitation. The harder the rain falls the stronger the downdraft can become. Also, stronger winds aloft are sometimes able to be pulled down to the surface by the already established downdraft, adding to the intensity of the downward moving winds. The image below **(Image 1)** shows the updraft/downdraft interface of a thunderstorm where low level wind shear might suddenly occur.

**Image 1.**



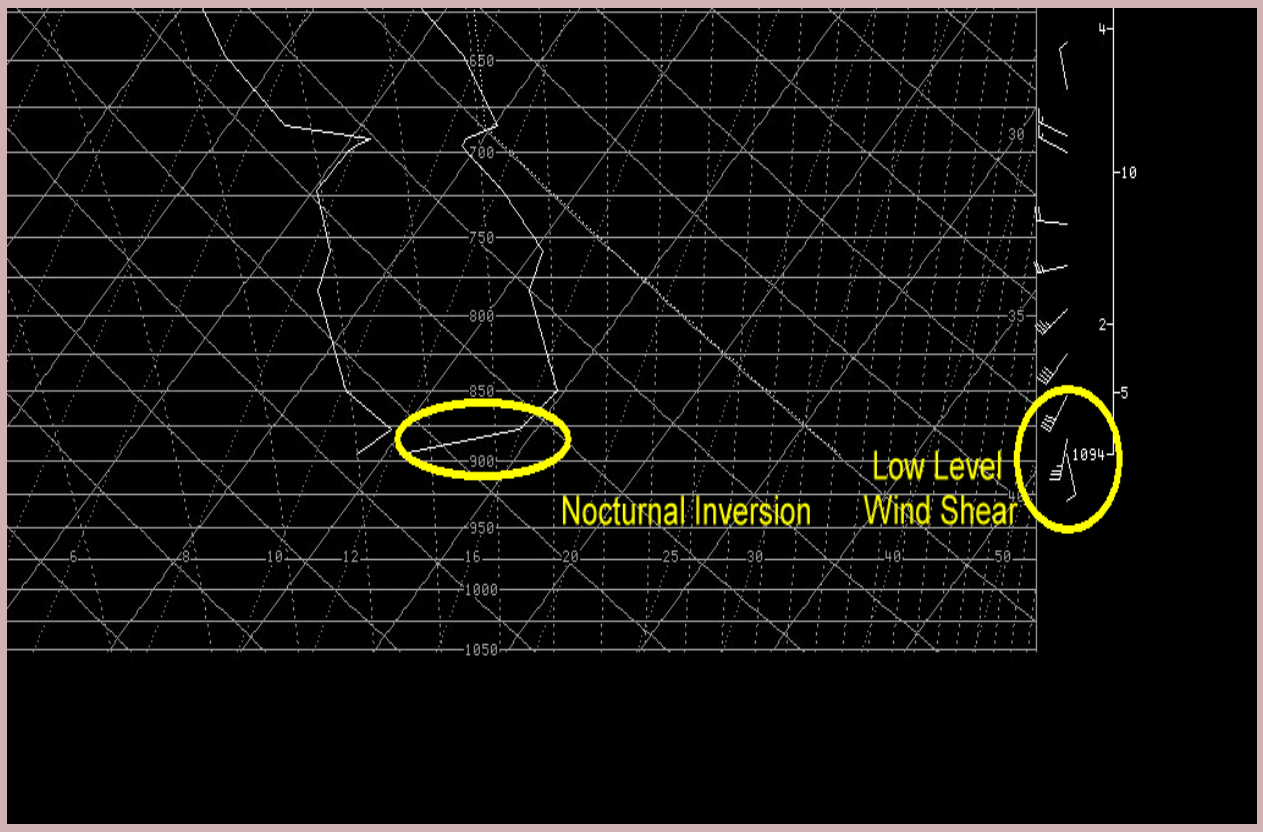

**(University of Illinois "Updrafts/Downdrafts: Rising and Sinking Air")**

Another way that low level wind shear can occur is when a nocturnal inversion sets up as the lowest levels of the atmosphere decouple from the upper levels and stronger winds. A nocturnal inversion is basically a layer of warm air that develops in the lowest few thousand feet of the atmosphere as the planetary boundary layer becomes decoupled or "disconnected" from the stronger upper level winds. The layer of warm air marks the interface between the calmer and much cooler layer of air near the surface and the stronger winds and more well mixed atmosphere above the inversion. This interface is another area where wind shear can occur. Many times, the vertical temperature gradient between the inversion and the atmosphere above can create the pressuregradient necessary for a low level jet between 25 (weaker) and 60 (stronger) knots. So, imagine taking off on a calm evening and climbing through 5 thousand feet. Suddenly, you encounter serious turbulence as a headwind or tailwind of 40 knots rocks your aircraft and changes your airspeed dramatically. This effect can quickly cause a pilot to lose control of the aircraft, especially if they are caught off guard or have never experienced the phenomenon before. To better understand the nocturnal inversion and low level jet refer to **Image 2** on the next page.

## Low Level Wind Shear: Invisible Enemy to Pilots (Continued)

By: Brian Schoettmer
General Forecaster

**Image 2:**




**The image above is a balloon sounding taken from Amarillo, Texas on the morning of September 1st, 2009. The white line on the right indicates temperature from the surface (bottom) up through the atmosphere. Notice the increase in temperature just above the surface, this is the nocturnal inversion. If you look at the wind barbs to the right, you see an example of low level wind shear. There is a southeasterly wind at the surface around 10 knots, then the wind increases to 35-40 knots out of the southwest over a short vertical distance. The temperature gradient caused by the nocturnal inversion helps to create the low level jet around 40 knots in this case.**

As mentioned above, many changes to how we detect and react to low level wind shear have changed since the landmark crash of Flight 191. With the advent of the WSR-88D, **(Weather Surveillance Radar 1988 Doppler)** low level velocity data has aided in the detection of low level wind shear. Many large airports now have TDWR's **(Terminal Doppler Weather Radar)** installed near the airport to help detect changes in wind speed and direction. Also, at the time of the Flight 191 crash, the FAA was in the process of testing and implementing LLWAS. **(Low Level Windshear Alert System)** Although the new system had shown promise in detecting low level wind shear in other incidents in recent years, it was not able to detect wind shear before the Dallas/Fort Worth crash in 1985. As a result, the nation demanded something be done. In 1986, the Federal Aviation Administration announced the National Integrated Windshear Plan. This included better training for pilots in how to detect and handle windshear situations and eventually led to the development of the TDWR's at airports today. (**Ref 1)**

For more information on thunderstorm processes, low level wind shear, and forecasting techniques, including how the National Weather Service forecasts wind shear in Terminal Aerodrome Forecast's go to: **http://www.crh.noaa.gov/Image/lmk/aviation-conference/av-conf-talks/Wind_shear_final.pdf**

**References:**

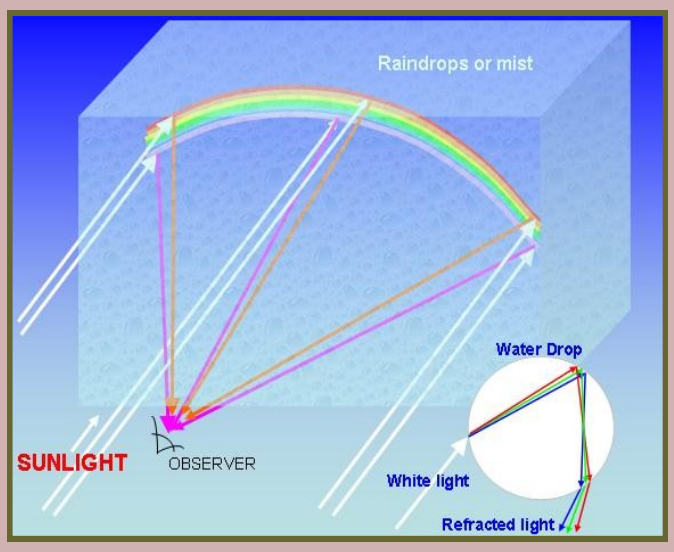
**Ref. 1 Airborne Trailblazer, Chapter 5: "The Best We Can Do", Taming the Microburst Windshear, Wallace, Lane E. 1994, 198p.**

**(http://oea.larc.nasa.gov/trailblazer/SP-4216/chapter5/ch5.html)**

## Kid's Korner

By: Anthony Richey
General Forecaster

Ever wondered how rainbows form? Whenever sunlight shines onto droplets of water or ice crystals in the earth's atmosphere, the white light is bent as it bounces around inside the water drop or ice crystal. This causes the white light to become separated into the many colors that make up the suns light. The result is the brightly colored arc of light we know as a rainbow. The colors of the rainbow begin as red on the outside of the arc and consist of orange, yellow, green, blue, indigo, and violet bands as you go toward the inside of the rainbow color arc. Rainbows can be observed whenever there are water droplets in the air and sunlight shines from behind the person observing the rainbow. That means that rainbows can also be seen near the mist from waterfalls or from spray created by ocean waves as they crash onto shore.




**Riddle:** A type of precipitation comes your way,
add a "d" and it will run away.

**Answer: Rain … Add "D" Drain**

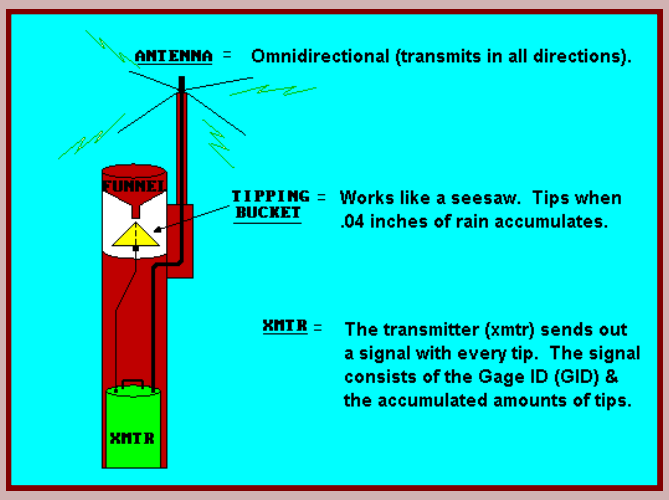
## IFLOWS

The IFLOWS program will be expanding rain gage coverage to Laurel, McCreary, Pulaski, Rockcastle, and Wayne counties. IFLOWS stands for the Integrated Flood Observation and Warning System. This program was started in the late 1970's.

The goals of the program are to substantially reduce the loss of life, property, as well as the disruption of human and commerce activities associated with flash floods. The IFLOWS gages can provide invaluable data during heavy rainfall events, and aids the NWS at Jackson Kentucky with flash flood warning making decisions.

Over the next several months, the State of Kentucky will be partnering with County Emergency Managers, the National Weather Service at Jackson, as well as other public officials in order to determine proper siting of these gages. For more information on IFLOWS, visit the website: http://www.afws.net. There is also a direct link from the AHPS page under the Additional Resources section labeled IFOWS Gages.

IFLOWS




Inside of an IFLOWS

Visit us on the web at: http: //www.weather.gov/

**Solution to Quiz on Page 10:** 1. Occluded Front, 2. Degree Day, 3. Nowcast, 4. Dew, 5. Dew Point, 6. Thunder, 7. Knot, 8. Evaporation, 9. Eye, 10. Lightning, 11. Contrail, 12. Flood, 13. Fog, 14. Frost, 15. Calm.

# Weather Terminology Quiz

How weather savvy are you?? Test your knowledge of these basic terms used by the National Weather Service's meteorologists. Each word will only be used once and some words may not be used at all.


| | | |
|---|---|---|
| Eddy | Halo | Dew |
| Evaporation | Lightning | Degree Day |
| Eye | Knot | Fog |
| Contrail | Flood | Occluded Front |
| Thunder | Calm | Gust |
| Dew Point | Nowcast | Thermometer |

**(Answers can be found on Page: 9)**

1. A complex frontal system that occurs when a cold front overtakes a warm front. _____
2. A measure of the departure of the daily mean temperature from the normal daily temperature. _____.
3. A short-term weather forecast, generally out to six hours or less. _____
4. Moisture from water vapor in the air that has condensed on objects near the ground, whose temperatures have fallen below the dew point temperature. _____
5. The temperature to which the air much be cooled for water vapor to condense and form fog or clouds. _____
6. The sound caused by a lightning stroke as it heats the air and causes it to rapidly expand. _____
7. A measure of speed. It is one nautical mile per hour. _____
8. The process of a liquid changing into a vapor or gas. _____
9. The low pressure center of a tropical cyclone. _____
10. Any form of visible electrical discharges produced by thunderstorms. _____
11. A cloud-like stream formed in cold, clear air behind the engines of an airplane. _____
12. A condition that occurs when water overflows the natural or artificial confines of a stream or river. _____
13. Water that has condensed close to the ground level, producing a cloud of very small droplets that reduces visibility to less than one km. _____
14. The formation of thin ice crystals on the ground or other surfaces. It develops when the temperature of the exposed surface calls below 32 degrees Fahrenheit and water vapor is deposited as a solid. _____
15. The absence of apparent motion in the air. _____

**Fire Weather**
By: Jonathan Pelton
Lead Forecaster

## What is Fire Weather Awareness Week?

The National Weather Service Forecast Office (NWSFO) in Jackson, KY along with the NWSFO in Morristown, TN and other nearby offices have conducted Fire Weather Awareness Week since 2003 in conjunction with federal and state land management agencies. This week coincides with Fire Prevention Week in early October each year. This year, the week will run from October 4th through October 10th. During the week, between Monday the 5th and Friday the 9th, the NWSFO in Jackson will issue Public Information Statements concerning issues relating to weather and climate conditions and their effect on wildfires as well as a brief overview of safety tips relating to outdoor burning.

Each day during the week, a different topic will be discussed, which will help educate listeners of NOAA weather radio, visitors to the National Weather Service in Jackson, KY internet webpage, and the general public through local media outlets.

The purpose of the week and statements that will be issued each day is to increase public awareness of fire weather and fire safety. Unfortunately, nearly all wildfires in Kentucky are human caused or are human related. About 60 percent of all wildfires are set intentionally by arsonists. You can help fire and law enforcement authorities catch arsonists by providing information to the Target Arson Hotline at 1-800-27-ARSON, that is-1-800-272-7766.

The topics for each day during the week include:

Monday - General Fire Weather
Tuesday - How Weather Conditions Affect Fire Behavior
Wednesday - Drought and Its Effects On Wildfires
Thursday - Red Flag Warnings and Extreme Fire Weather Conditions
Friday - The Fall and Spring Fire Weather Seasons

Each topic will be highlighted as a Top News of the Day headline each day during the week. For additional fire weather information, please go to the following website: http://www.crh.noaa.gov/jkl/?n=fire.